WHAT IS CLAIMED IS:

1. A method of forming a fuel cell, comprising the steps of:

forming a first aperture defined by a first aperture surface through a first electrode layer;

forming a second aperture defined by a second aperture surface through a second electrode layer; and

laminating a proton exchange membrane between the first electrode layer and the second electrode layer where the first aperture is at least partially aligned with the second aperture, forming a fuel cell.

2. The method according to claim 1, further comprising the step of providing an adhesive between the first electrode layer and the proton exchange membrane and between the second electrode layer and the proton exchange membrane.

3. The method according to claim 2, wherein the adhesive providing step precedes the step of forming the first and/or second aperture.

4. The method according to claim 2, wherein the aperture forming steps precede the step of providing an adhesive between the first electrode layer and the proton exchange membrane and between the second electrode layer and the proton exchange membrane.

5. The method according to claim 1, further comprising the step of providing a conductive layer on the first electrode layer and the second electrode layer.

6. The method according to claim 1, further comprising the step of providing a conductive layer on the first electrode layer and the second electrode layer after the aperture forming steps.

7. The method according to claim 1, further comprising the step of providing a conductive layer on the first electrode layer and the second electrode layer, wherein the first and second electrode layers are substantially non-conductive.

8. A method of forming a plurality of fuel cells, comprising the steps of:

forming a first plurality of apertures through a first electrode sheet;

forming a second plurality of apertures through a second electrode sheet; and

laminating a proton exchange membrane between the first electrode sheet and the second electrode sheet, where the first plurality of apertures is at least partially aligned with the second plurality of apertures, forming a plurality of fuel cells.

9. The method according to claim 8, further comprising the step of providing an adhesive between the first electrode sheet and the proton exchange membrane and providing an adhesive between the second electrode sheet and the proton exchange membrane.

10. The method according to claim 9, wherein the adhesive providing step precedes the step of forming a first plurality of apertures and forming a second plurality of apertures.

11. The method according to claim 9, wherein the aperture forming steps precede the step of providing an adhesive between the first electrode sheet and the proton exchange membrane and between the second electrode sheet and the proton exchange membrane.

12. The method according to claim 8, wherein the laminating step comprises laminating the proton exchange membrane between the first electrode sheet and the second electrode where the first electrode sheet and the second electrode sheet extend beyond the proton exchange membrane in at least one region.

13. The method according to claim 12, further comprising providing a number of patterned first electrodes on the surface of the first electrode sheet that is adjacent to the proton exchange membrane and a number of patterned second electrodes on the surface of the second electrode sheet that is adjacent to the proton exchange membrane, at least part of the first and second patterned electrodes extending into the at least one region.

14. The method according to clam 13, wherein at least one of the first electrodes overlaps at least one of the second electrodes in the at least one region and makes electrical contact thereto.

15. A fuel cell comprising:

a first electrode comprising:

a first electrode top surface;

a first electrode bottom surface;

a first electrode thickness defined by a first distance between the first electrode top surface and the first electrode bottom surface;

a first electrode aperture through the first electrode thickness defined by a first electrode aperture surface;

a second electrode comprising:

a second electrode top surface;

a second electrode bottom surface;

a second electrode thickness defined by a second distance between the second electrode top surface and the second electrode bottom surface;

a second electrode aperture through the second electrode thickness defined by a second electrode aperture surface;

a first conductive layer disposed on at least a portion of the first electrode top surface, at least a portion of the first electrode bottom surface, and at least a portion of the first electrode aperture surface;

a second conductive layer disposed on at least a portion of the second electrode top surface, at least a portion of the second electrode bottom surface, and at least a portion of the second electrode aperture surface;

a proton exchange membrane in electrical contact with and disposed between the first conductive layer and the second conductive layer;

wherein, the first electrode aperture is at least partially aligned with the second electrode aperture.

16. The fuel cell according to claim 15, further comprising a top catalyst layer and a bottom catalyst layer adjacent the proton exchange membrane.

17. The fuel cell according to claim 15, wherein the proton exchange layer has a thickness of 1 mil or less.

18. The fuel cell according to claim 15, wherein the first aperture surface defines a first aperture cross-sectional surface area of 1 mm^2 or less.

19. The fuel cell according to claim 15, wherein the first conductive layer has a thickness of 1000Å or less.

20. The fuel cell according to claim 15, wherein the second conductive layer having a thickness of 1000Å or less.

21. The fuel cell according to claim 15, wherein the first electrode thickness and the second electrode thickness are 2 mil or less.

22. A fuel cell comprising:

a first electrode having a first aperture;

a second electrode having a second aperture; and

a proton exchange membrane in electrical contact with and disposed between the first electrode and the second electrode and spanning the first aperture and the second aperture;

wherein, the first aperture is at least partially aligned with the second aperture and the proton exchange layer is unsupported across at least a major portion of the first aperture and the second aperture.

23. A fuel cell, comprising:

a top layer having a first plurality of electrical contacts and a first plurality of apertures where at least selected first electrical contacts extend from adjacent corresponding apertures to a first region;

a bottom layer having a second plurality of electrical contacts and a second plurality of apertures wherein where at least selected second electrical contacts extend from adjacent corresponding apertures to a second region, wherein the first region at least partially overlaps the second region in an overlap region; and

a proton exchange membrane disposed between the top layer and bottom layer adjacent the apertures but not in the overlap region.

24. The fuel cell according to claim 23, wherein an adhesive layer is disposed between the proton exchange membrane and the top layer, between the proton exchange membrane and the bottom layer, or between the proton exchange membrane and the bottom and top layers.

25. A method of forming a plurality of fuel cells, comprising the steps of:

providing a first length of material having a first plurality apertures and a first plurality of electrical contacts;

providing a second length of material having a second plurality apertures and a second plurality of electrical contacts;

providing a proton exchange membrane;

moving the first length of material into a joining unit;

moving the second length of material into the joining unit such that the second plurality of apertures are at least partially in registration with the first plurality of apertures; and

moving the proton exchange membrane into the joining unit simultaneously with and in between the first and second length of material, at least part of the proton exchange membrane aligned with the plurality of first and second apertures to form a plurality of fuel cells.

26. The method according to claim 25, further comprising the step of providing an adhesive layer between the proton exchange membrane and the first length of material, between the proton exchange membrane and the second length of material, or between the proton exchange membrane and the first and second length of material.

27. The method according to claim 25, further comprising the step of dicing the plurality of fuel cells into single fuel cells.

28. The method according to claim 25, further comprising the step of dicing the plurality of fuel cells into arrays of fuel cells.